

IMPACT OF THE MEDICARE CATASTROPHIC ACT ON THE LONG -TERM CARE SYSTEM

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EXECUTIVE SUMMARY

The Medicare Catastrophic Coverage Act (MCCA) of 1988 (Public Law 100-360) altered eligibility and coverage for Skilled Nursing Facility (SNF) and hospice care and changed Medicaid eligibility rules for nursing home residents. Except for the single year in which the MCCA was in effect, Medicare's SNF benefit applied only when the resident received daily skilled nursing or rehabilitative care following discharge from a hospital stay of 3 or more days. Under the MCCA the benefit still covered only skilled and rehabilitative care, but copayments, the coverage period, and the restriction of a prior hospital stay were altered. The MCCA also repealed the 210 day limit for hospice coverage.

This paper examines the impact of the MCCA on the long-term care system, using two different data sources--detailed data on the residents of the National Health Corporation (NHC) nursing home chain and Medicare claims data for a 1% sample of beneficiaries. NHC nursing homes have a disproportionate share of Medicare residents, and, while these data are not representative of the nation as a whole, they are ideal for studying the impact of Medicare provisions of the MCCA on the long-term care system. The Continuous Medicare History File contains longitudinal Part A and Part B claims data for a 5% random sample of all Medicare beneficiaries. We identified beneficiaries who were at least 70 years of age and who had at least one nursing home episode, as evidenced

by a Part A SNF claim or a Part B claim in which place of service was a nursing home. A single episode continued until there was evidence of a discharge to a rehabilitation hospital, receipt of home health care, death or a discharge to a hospital without a return to the nursing home. If the resident returned to a nursing home following a hospital stay, the episode continued until one of the episode termination criteria was met.

We examine the impact of the MCCA on the mix of residents admitted to nursing homes, their length of stay, discharge disposition and rate of hospitalization. We also examine the effect of this legislation on changes in payer source among nursing home residents and on the duration and clinical content of Medicare-covered nursing home stays. Finally, we examine the case-mix and length of stay of hospice patients.

The pattern of findings suggests that the nursing home industry and Medicare beneficiaries benefited from the MCCA changes to the SNF and hospice benefits. In both data sets we found that the proportion of all nursing home episodes with a Medicare SNF component increased while the MCCA provisions were in effect. More residents were admitted to nursing homes directly from home in that year, particularly those reimbursed by Medicare. There was a shift in the case mix severity of individuals entering and cared for in nursing homes as evidenced by the significant increase in clinically complex patients admitted to NHC nursing homes in 1989 and the increase in deaths within the nursing home in both the NHC and the Medicare claims files. We observed an increase during the MCCA period in the proportion of nursing home episodes with a Medicare claim for services for "sicker" patients (i.e., parenteral nutrition or therapies, pulmonary care, oxygen, inhalation therapy, special services and consultations). The length of stay of

nursing home episodes, particularly Medicare SNF episodes, increased dramatically in 1989, with a reduction in the proportion of all stays that lasted less than 7 days and an increase in the proportion of stays lasting between 22 and 150 days. Thus, there was a significant increase in the total number of Medicare covered SNF days in 1989 relative to earlier as well as later years.

Although we had expected that the rate of hospital use among nursing home residents would have declined due to the MCCA provisions allowing a shift to Medicare payment without a hospital admission, we observed little reduction in hospital use except among nursing home episodes lasting between 91 and 150 days. On the other hand we observed a large increase in the proportion of episodes in which nursing home residents shifted their payer source to Medicare from either Medicaid or private pay. Such payer source transitions were over 3 times more prevalent in 1989 than in previous years among NHC residents and over 50% more common, based upon the less precise but nationally representative Medicare claims data. Thus, there was a substantial increase in Medicare SNF use with no off-setting reduction in Medicare reimbursed hospitalizations.

Our hospice findings indicate that the MCCA also had an impact on hospice, but a less dramatic one. The proportion of patients with a hospice length of stay greater than 210 days increased. Although the proportion of non-cancer patients using hospice services increased, this trend may have already been underway, as we observed that more nursing home residents began to enter hospice. This finding is consistent with the expanded role of nursing homes in the care of the dying patient and the growing number of hospices and nursing homes who are jointly caring for these individuals.

Attributing all these changes unequivocally to the MCCA is difficult, since many of the trends which began in 1989 continued after the MCCA was repealed. The MCCA clearly accelerated changes in the nursing home industry and in the types of residents served as well as the services provided. Some might argue that the excitement about subacute and post-acute care that is sweeping the field would not have been possible had not the MCCA stimulated the industry to increase its capacity to meet the needs of the traditional Medicare SNF patient. This capacity building and stimulus to compete in the Medicare SNF field came at a price. There was a substantial increase in the number of covered Medicare days and Medicare SNF expenditures and little compensatory reduction in hospital use. The MCCA permitted the nursing home industry to play new roles in the provision of care for the terminally ill and for the severely medically compromised. These new roles are now being more fully developed in the market place for delivering medical care to the chronically ill -- the world of managed care. Whether the nursing home industry will be able to successfully compete on price and quality with post-acute facilities sponsored by hospital systems will be seen over the remainder of this decade. In the final analysis, for the nursing home industry the MCCA was more than a series of technical modifications to Medicare SNF reimbursement eligibility rules. It was the recognition of a transformation in the delivery of skilled nursing care and a first step in acknowledging the indivisibility of the acute and long-term care sectors for chronically ill and frail elders.

Impact of the Medicare Catastrophic Coverage Act on the Long-Term Care System

Linda Laliberte, JD, MS

Vincent Mor, PhD

Katherine Berg, PhD

Jane Banaszak-Holl, PhD

Orna Intrator, PhD

Kathleen Calore, MA

Jeffrey Hiris

Prepared in conjunction with HCFA contract #500-89-0063 to Abt Associates, Inc.

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Linda Laliberte is the Associate Director of the Center for Gerontology and Health Care Research at Brown University. Vincent Mor is Professor of Medical Science and the Director of the Center. Katherine Berg and Orna Intrator are Assistant Professors (Research) and Jeffrey Hiris is the systems manager at the Center. Kathleen Calore was formerly an analyst at Abt Associates, Inc. and is a graduate student at Brown University. Jane Banaszak-Holl is an Assistant Professor at the University of Michigan.

ABSTRACT

The Medicare Catastrophic Coverage Act (MCCA) of 1988 (Public Law 100-360) altered eligibility and coverage for Skilled Nursing Facility (SNF) and hospice care and changed Medicaid eligibility rules for nursing home residents. The limited duration of these changes provided a unique opportunity to study the effect of these policies. This paper examines the impact of the MCCA on the long-term care system, using two different data sources--detailed data on the residents of a for-profit nursing home chain and Medicare claims data for a 1% sample of beneficiaries. We examine the mix of residents admitted to nursing homes, their length of stay, discharge disposition and rate of hospitalization. We also examine the effect of this legislation on changes in payer source among nursing home residents and on the duration and clinical content of Medicare-covered nursing home stays. Finally, we examine the case-mix and length of stay of hospice patients. Although the proportion of Medicare-financed nursing home care increased along with case-mix severity of residents during the MCCA period, there was no reduction in hospital use by nursing home residents. The proportion of patients with a hospice length of stay greater than 210 days also increased.

INTRODUCTION

Over the past decade the Health Care Financing Administration (HCFA) has implemented policy changes in the Medicare and Medicaid programs that have affected various aspects of the long-term care system. In the 1987 Omnibus Budget Reconciliation Act (OBRA) (Public Law 100-203), Congress mandated numerous regulatory changes designed to improve the quality of care provided residents by making changes in the facility survey process and mandating new approaches to documenting patient care. The Medicare Catastrophic Coverage Act (MCCA) of 1988 (Public Law 100-360) altered eligibility and coverage for skilled nursing facility (SNF) and hospice care and changed Medicaid eligibility rules for nursing home residents. HCFA's issuance of an administrative directive (HCFA transmittal #222) clarifying and expanding the definition of what constitutes skilled care services under the Medicare SNF benefit resulted in a more liberal application of eligibility determinations by fiscal intermediaries (Bishop and Dubay, 1991). In addition to these explicit legislative and regulatory changes, continued pressure on the acute care sector to reduce lengths of hospital stay progressively increased the acuity level of individuals entering nursing homes and receiving home health services (Shaughnessy and Kramer, 1990).

The purpose of this paper is to examine the impact of the ill-fated MCCA on nursing homes and hospices. In interpreting the results of our empirical analyses, we consider that the MCCA did not occur in a policy vacuum and may have instigated changes in the hospice and nursing home industry which continued beyond the year in which the MCCA was in effect.

BACKGROUND

When the MCCA was enacted in mid-1988, nursing homes were still struggling with the impact of hospital cost containment initiatives of the mid 1980's and facing the numerous reforms mandated in OBRA (1987). The MCCA brought additional reforms, affecting nursing home and hospice programs via changes in Medicare eligibility and reimbursement rules, changes in the role of the hospital as the arbiter of post-acute care, and changes in Medicaid eligibility. Each legislative change may have altered existing patterns of care in both nursing homes and hospices.

Medicare's SNF benefit applies only when the resident receives daily skilled nursing or rehabilitative care following discharge from a hospital stay of 3 or more days. Under the MCCA the benefit still covered only skilled and rehabilitative care, but copayments, the coverage period, and the restriction of a prior hospital stay were altered. Prior to MCCA a daily copayment of \$67.50 applied to days 21-100 of the nursing home stay, while during the MCCA year the average daily copayment level was \$20.50 and applied only to days 1-8. The coverage period increased from 100 to 150 days, none of which are subject to a copayment. The MCCA eliminated the three-day prior hospitalization requirement, so that beneficiaries who needed skilled or rehabilitative care could enter SNFs directly from home or could switch from another payer to Medicare, while remaining in the same skilled nursing facility.

Federal policy innovations may have had counterbalancing effects on payer source changes among the nursing home resident population during and after MCCA. By reducing copayment levels and increasing the Medicare share of the nation's nursing home bill, MCCA may have reduced or delayed patients' dependence on Medicaid as a payer source. Newly admitted residents with income or assets in excess of the Medicaid eligibility thresholds could, by becoming

Medicare-eligible, or by remaining Medicare-covered for longer periods under the MCCA guidelines, slow the process of spending-down their assets. However, the MCCA also tightened Medicaid eligibility by changing the “lookback period” from 24 to 30 months (effective 7/1/88). This meant that assets which were transferred within 30 months of applying for Medicaid were countable resources in determining eligibility. On the other hand, Medicaid eligibility criteria became less restrictive under the MCCA “spousal impoverishment” provision, which increased the income and asset allowances which community-dwelling spouses of nursing home residents could retain while preserving Medicaid eligibility. This provision went into effect 9/30/89 and survived the MCCA repeal.

When Congress first approved Medicare reimbursement for hospice care in 1982, payments were restricted to 210 days of coverage for those beneficiaries with a terminal prognosis of 6 months or less (Public Law 97-248). Federal regulations governing Medicare hospice payments have changed in response to continuing public advocacy, consumer concerns, industry interests, and published studies on hospice use. The Consolidated Omnibus Budget Reconciliation Act (COBRA) of 1985 (Public Law 99-272) amended the Medicaid law to allow states the option of paying for hospice services for terminally ill beneficiaries. The Omnibus Budget Reconciliation Act (OBRA) of 1986 (Public Law 99-509) mandated state support of hospice services for certain beneficiaries in those states which did not offer the optional COBRA hospice benefit. For SNF or intermediate care facility (ICF) residents who elected to receive hospice care, and who met both Medicare and Medicaid eligibility requirements, OBRA ‘86 required states to pay the hospice program at least 95% of the fees allocated under Medicaid for SNF or ICF room and board expenses. The Medicare program would reimburse the hospice at normal home care daily rates.

Prior to 1989, federal policy discouraged hospice programs from accepting large numbers of patients who might need extended periods of inpatient care or whose prognosis included a probable chance of survival beyond the 210 day reimbursement limit. Consonant with the hospice philosophy which encouraged home care for hospice patients, reimbursement policies restricted hospices to a maximum aggregate number of inpatient days totaling no more than 20% of all service days; also, hospices were required to continue providing care to Medicare beneficiaries even after public reimbursement limits were reached. Under the MCCA, effective January 1, 1989, the 210 day care limit was repealed. Hospices could thus accept patients with a broader range of diagnoses and prognoses as well as patients with fewer family supports so crucial to remaining at home, and they could do so without the financial risks which they had to assume under the 210 day limits. Although this provision was repealed along with most of the other Medicare provisions of the Act, it was reinstated in the Omnibus Budget Reconciliation Act (OBRA) of 1990 for care provided on or after 1/1/90, allowing for continuation of this benefit without any gaps due to the MCCA repeal.

This paper examines the impact of the MCCA on the long-term care system. We examine the mix of residents admitted to nursing homes, their length of stay, discharge disposition and rate of hospitalization. We also examine the impact of MCCA on changes in payer source among nursing home residents and on the duration and clinical content of Medicare-covered nursing home stays. Finally, we examine the case-mix and length of stay of hospice patients.

DATA AND METHODS

We use two data sources for these analyses: (1) the National Health Corporation (NHC) computerized resident assessment and follow-up data on all residents in 48 nursing homes in six

states, and (2) the Continuous Medicare History Sample, which contains longitudinal Part A and B claims data for a 5% random sample of all Medicare beneficiaries. From these data sets we constructed analytic files specifically designed to address the major study research questions.

NHC Data

National Health Corporation, a for-profit organization which owned or managed 82 nursing homes in nine Southeastern states as of 1986, (48 homes were continuously owned in the study period) has maintained computerized resident assessment data since 1974 and have made this data available for research purposes. The data are derived from assessments conducted at admission, at an interval of one to three months post-admission, and on a periodic basis during residency (ranging from monthly to quarterly depending on level of care). Reassessments are conducted at any point-of-change in level of care and at discharge. Along with basic demographic information, assessments contain detailed information on residents' physical functioning, cognitive functioning, need for skilled nursing services, use of various classes of pharmaceuticals and use of other special services. Furthermore, the status of all residents who are discharged from NHC facilities is documented via telephone follow-up three months after discharge. (NHC, 1983). By linking assessment and discharge follow-up records, a wealth of longitudinal, resident-level information is available, including demographics, health and functional status, intermittent hospital admissions and dates of payment sources changes. powerful analytic files can be created.

The NHC data is ideal for studying the impact of MCCA on the mix of residents served in nursing facilities because, in contrast to most U.S. nursing homes, its facilities have traditionally served a high volume of Medicare residents. The reaction of NHC to MCCA would necessarily be swifter than that of other facilities which may not have had the incentives or the organizational

capacity to respond to changes in Medicare reimbursement provisions such as those contained in the MCCA. As such, NHC might be thought of as an "industry leader" whose behavior might suggest how other facilities would have responded had MCCA been in effect longer. NHC analysis files are described below.

Admissions Cohorts from 1984 - 1989. This analytic file contains data on 59,275 admissions to any NHC facility from 1983 to 1989, the associated length of stay, and, when appropriate, discharge disposition. The unit of analysis is the admission and not the individual; individuals can be represented multiple times in this analytic file if they had multiple admissions during the study period. One-half (29,150) of all admissions were covered by Medicare, and 10% (5,572) of all admissions came directly from home. This file was used to test the effect of the MCCA on the mix of residents admitted to nursing homes in terms of pre-admission status, payer source, case mix, length of stay and discharge disposition.

Admissions Followed Through Discharge 1986-1990. The NHC data make it possible to examine changes in payer source across multiple nursing home episodes, since we are able to follow a single resident over successive admissions to the same facility, including those residents who are hospitalized or enjoy brief home stays and later return to the same nursing home or another NHC facility. This file contains longitudinal assessment data for all residents who were first admitted to NHC facilities anytime between January 1, 1986, and October 1, 1990. To identify new admissions for this analytic file, we selected cases which met the following criteria: (1) the first known record was classified as an admission record, (2) the resident's prior location was not a nursing home, (3) the cumulative length of stay at the time of admission was zero, and (4) the resident's identification number did not appear in the prior year's records. This file was

used to test the impact of the MCCA on the probability and rate of change in payer source from private or Medicaid to Medicare.

Health Care Financing Administration 5% File

The population included in the analytic files used in our MCCA analyses represents a 20% sample of the five percent sample (i.e., one percent) of elderly Medicare beneficiaries who were enrolled and alive on April 1, 1986. Two groups of Medicare beneficiaries are excluded from the sample: those with cross-referenced claims (i.e. receiving services under more than one Health Insurance Claim (HIC) number) and those who were enrolled in a health maintenance organization (HMO) at any time during the study period. Cross referenced beneficiaries are excluded since the referenced HIC number is not within the 5% sample, and the claims history for these beneficiaries could be incomplete. The HMO group is excluded because the claims history for beneficiaries in HMO's does not represent a complete record of claims history. We linked Part A and Part B claims data from 1986 through 1992 for the cohort of Medicare beneficiaries who were alive on 4/1/86. Analysis files created from these data are described below.

Nursing Home Episode File. To examine the duration, cost and composition of nursing home episodes from the longitudinal cohort of 345,873 elderly beneficiaries, we selected beneficiaries who were at least 70 years of age who had at least one nursing home episode. To assure adequate follow-up time, we excluded nursing home episodes which began in 1992, but followed all prior episodes through December 31, 1992.

Our operational definition of a nursing home episode was triggered by evidence of a Part A SNF claim (skilled care) or a Part B claim in which place of service was a nursing home. Once the episode was triggered it was considered a single episode as long as there was evidence of

continued nursing home care, (i.e., a Part A SNF claim or a Part B claim indicating the nursing home as place of service) with no more than a 60-day gap between these Part B claims. A nursing home episode beginning with a SNF stay continues after the resident is discharged from skilled care as long as the resident remains in the nursing (as evidenced by appropriate Part B claims), provided that no more than 60 days elapse between these Part B claims. Episodes may also begin with a Part B claim and convert to a SNF (Part A) claim. These nursing home episodes also continue until an indication of a discharge or a gap of 60+ days with no Part B nursing home claim. However, if a hospitalization follows a SNF discharge, the nursing home episode continues through that hospitalization as long as the patient returns to a nursing home.

A nursing home episode may be terminated in several ways. Following a hospital admission, if there is no return to the nursing home within 60 days, the day prior to admission to the hospital is used to define the end of the nursing home episode. If there is no hospital stay terminating the nursing home episode and there is a 60-day period without a nursing home claim, the episode terminates on the date of the last claim. A claim for hospice, home health or an admission to a rehabilitation (long-stay) hospital terminates the nursing home episode on the date prior to the start of service date on the claim. A nursing home episode also will terminate when there is a valid date of death for the resident.

Hospice Claims Data. This file included data on 5% of all hospice beneficiaries who entered hospice programs during the years 1987 through 1990. A total of 11,750 beneficiaries were identified, indicating that 235,000 Medicare beneficiaries used the hospice benefit during this period. For these beneficiaries, any hospice stay which began during the study period was included. Although multiple hospice stays are unusual, when they occur they are usually with the same provider. In this sample, only three percent (292) of the beneficiaries had more than one

hospice stay and only seven beneficiaries had three or more stays. Although few in number, beneficiaries with multiple hospice stays have been shown to incur some of the highest costs, largely because they have long lengths of stay (Shalala, 1993).

Since length of stay was determined by the length of a beneficiary's enrollment period, regardless of whether this period exceeded payment eligibility, and since claims were available up to June of 1992, this data file includes a small but substantial number of beneficiaries who have relatively long lengths of stay. This is in contrast to data used in other studies, such as the report on the High Cost of Hospice (Shalala, 1993), which truncated lengths of stay by limiting them to a specific study period.

Once the sample of hospice beneficiaries was identified, Medicare Part A and B claims data were matched not only for the hospice period, but also for periods of 30, 180 and 360 days prior to and 90 days subsequent to hospice use (for the small number of patients who had any "post-hospice" reimbursements). Medicare claims were aggregated to total reimbursements for the hospice period and for pre-and post-hospice periods using the date of hospice enrollment and disenrollment as the cut points for generating the periods over which claims are aggregated.

Specification of Hypotheses and Outcomes

We examined the impact of the MCCA on the following outcomes: nursing home case mix, length of stay, discharge disposition and payer source transition rates; hospitalization rates among nursing home residents; the clinical content of nursing home episodes; hospice case-mix and hospice length of stay.

Nursing Home Measures. Nursing home residents are classified as being admitted from home, from a hospital, or from another nursing home. Based on the changes in the MCCA SNF

provisions, we hypothesized that Medicare admissions to nursing homes would increase, that admissions to nursing homes directly from home would increase, and that lengths of stay would be longer in the MCCA year. We also expected that the number of intermittent hospitalizations among nursing home residents would decrease and that case-mix severity would increase because patients would not have to be hospitalized to qualify for SNF coverage.

We also hypothesized that the proportion of nursing home stays with a discharge disposition of death would increase during the MCCA year because elimination of the 3-day prior hospital stay requirement made it possible for terminally ill patients to enter nursing facilities directly from home. In analyses based upon NHC data, discharge disposition of nursing home residents is classified as home, hospital (acute care), another nursing home or death. The HCFA nursing home episode file also includes home health and rehabilitation hospital transfer as discharge dispositions.

The NHC data files included functional status, clinical condition, and diagnosis as indicators of case-mix severity at admission. Activities of Daily Living (ADL) dependencies were defined as requiring human assistance and were categorized as three or fewer dependencies, four dependencies, five dependencies and able to eat, five dependencies and tube-fed. We also used a five-category summary of New York State's seventeen category Resource Utilization Group-II (RUG-II) case-mix reimbursement classification of nursing home residents according to the intensity of their need for services. Selected primary diagnoses also were chosen as indicators of clinical case-mix based on ICD-9 codes in the admission record. These conditions were any type of cancer, heart failure, pneumonia, and lower limb fracture. These diagnoses were selected because of their prevalence in nursing home populations and their association with skilled care.

During the MCCA year there was a potential for longer lengths of stay, particularly under Medicare, because of changes in the copayment schedule. We also expected to observe fewer intermittent hospitalizations because of the elimination of the 3-day prior hospital stay requirement for the SNF benefit. Length of stay is measured both as a continuous variable and as an ordinal measure in our analyses.

We hypothesized that a consequence of the increasing case-mix complexity of residents expected as a result of the MCCA year would be an increase in the proportion of patients with claims for services oriented to meet the needs of "sicker" patients. We used the nursing home episode file to examine the clinical content of nursing home stays. The "intensity" of medical services provided to nursing home residents is measured by the probability of having a Part A or Part B claim for the following classes of ancillary services: therapy, laboratory, drug, radiology, routine care (foot care, incontinence DME, decubitus care, venipuncture and chest x-ray) and services targeted to "sicker" patients (parenteral nutrition or therapies, pulmonary care, oxygen, inhalation therapy, special services and consults).

Because of the relaxed eligibility criteria for the SNF benefit during the MCCA year, we expected to see changes in payer source among nursing home residents, specifically, greater use of Medicare. We examined the rate of transition from self-pay or Medicaid to Medicare with both the NHC and the Medicare data files.

Hospice Measures. Since the MCCA relaxed the 210 day limit on coverage for hospice care, and we expected the length of stay of hospice beneficiaries to increase, we examined the proportion of hospice patients staying longer than 210 days. Patients with stays under 30 days usually have terminal stage cancers and extremely limited prognoses (Mor and Allen, 1987), and it is unlikely that the passage of the MCCA would cause any changes in their lengths of stay. Those

patients with long stays are likely to have non-cancer diagnoses or to lack family or community-based social supports to provide care. The length of stay for a hospice coverage period is calculated simply as the total number of days of hospice care, which may be discontinuous if there are gaps in enrollment. We carefully examined the number of cases in which there were "temporary disenrollments"; that is, when enrollees left hospice coverage to receive routine Medicare services such as hospitalization and surgery. We found only 250 individuals (i.e., 2%) who had disenrolled, meaning that hospice length of stay usually means a continuous period of hospice coverage.

Clarification that nursing home residents are eligible for the hospice benefit may have increased the diagnostic heterogeneity of hospice patients. The variable "nursing home use prior to hospice" was constructed to reflect the number of individuals with a nursing home claim (Part A or Part B) prior to hospice enrollment. We used the same decisional rules that were applied to create the nursing home episode file to identify cases with prior nursing home stays.

Analytic Approach

We characterized the trend in the various case-mix measures contained in the NHC annual admission cohorts over the seven-year period using contingency tables and the Mantel-Haenszel test for trend. In order to compensate for the large sample size, the Mantel-Haenszel test was evaluated for significance at the p=.001 level. The Mantel-Haenszel statistic is equivalent to the "scores" test when assuming a logistic distribution and testing the hypothesis of no association. In summarizing the data in the tables "significant" change is said to have occurred if the results of the Mantel-Haenszel test for trend met this threshold. We used logistic regression to test whether the change during the 1989 MCCA period significantly departed from what would have been

expected on the basis of the historical trend. To conduct this test, the logistic regression models contain two independent variable terms: a seven-level variable containing a category for each study year, and a separate indicator variable reflecting the 1989 year. The odds ratio associated with the 1989 term was evaluated at the p=.05 level of significance. It is adjusted for the effect of the linear term, which reflects the trend in NHC admissions between 1983 and 1989. Odds ratios that are greater than 1.0 suggest that nursing home admissions with the given characteristics are more likely to occur than would have been expected based on the linear trend. Odds ratios smaller than 1.0 indicate the opposite. In order to simplify both computation and interpretation, noncontinuous dependent variables with multiple categories were dichotomized and logistic regression models estimated.

The pattern of Medicare nursing home use in the nursing home episode file is analyzed according to "periods" defined in relation to the MCCA year. We analyze nursing home episodes within three periods: 1) episodes that begin and end prior to the MCCA year (PreMCCA); 2) episodes that begin and end during the MCCA year or extend beyond the MCCA year (MCCA Plus); and 3.) episodes that begin after MCCA (Post MCCA) but before 1992.¹ The observation period for the content of episodes continues until December 1992. We used a simple chi-square test to determine whether the proportion of Medicare beneficiaries with a particular quality of interest (e.g. discharge disposition) differed across the three groups of episodes. When the outcome variable of interest was a continuous variable, e.g. cost, or percentage of users of a given type of service, analysis of variance was used to compare the means across the three groups. The

¹ Episodes that began prior to the MCCA period but extended into it were dropped from these analyses because these episodes tended to be very long, highly heterogeneous and quite unique relative to all other episodes. Furthermore, there were only 4,654 episodes in this period, representing only 5.6% of all episodes.

same approach was used in comparing the proportion of Medicare beneficiaries entering hospice by whether the beneficiary was admitted before, during or after the MCCA year.

Using NHC longitudinal data, semi-Markov transition models were employed to test the effect of the MCCA year on the rates of change in payment source to Medicare, controlling for the competing risk of death or transition to another payment source. The model was run separately for each possible transition, including payer source changes, death, and censoring. The numbers of discharges to hospital or to home were treated as time varying covariates, since many of these residents returned to the nursing home and could continue to be monitored for payer source transitions. The risk set included all residents who were in the current "state." To estimate the rate of change from the current state "Medicaid" to the event "Medicare," we identified as the risk set all residents who were reimbursed by Medicaid at any point during their nursing home stay (i.e., in the current state). The risk of converting to Medicare was one of the possible transitions from Medicaid that could take place (including transitions to self-pay, other payers, death and censoring). Residents with Medicaid whose payer source changed to Medicare were considered to have an "event" and all others were censored. Details of the semi-Markov model and a more detailed treatment of the effect of the MCCA on spenddown to Medicaid appears in Intrator et al. (in press, 1996).

RESULTS

Changes in the Case-Mix of Admissions to Nursing Homes. Since the MCCA removed the 3-day prior hospital stay requirement for the SNF benefit, we expected to observe an increase in case-mix severity as nursing homes had reimbursement incentives to care for sicker patients. During the period 1983-1989, approximately 86% of NHC admissions came from a

hospital, 9% from home, and 4% from another nursing home (Table 1). There was a significant increase in admissions from home and a significant decrease in admissions from hospital from 1983 to 1989. The odds ratio associated with the MCCA year (1989) indicates that in addition to this linear trend, significantly more admissions were from home (O.R.=1.14) and significantly fewer were from a hospital (O.R.=0.88). These effects were even stronger when we examined Medicare admissions only (data not shown). Medicare residents were twice as likely to be admitted from home in 1989 (OR=2.01) and nearly one-half as likely to be admitted from a hospital (OR=0.55). Overall, and for Medicare admissions only, the odds of admission from another nursing home did not differ significantly in 1989 from that which would have been predicted based merely on the historical trend.

Over this period, one-half of admissions to NHC homes were Medicare-covered, with Medicaid accounting for approximately one quarter of admissions and self-pay accounting for approximately one-fifth of admissions (Table 1). The proportion of admissions covered by Medicaid decreased from 28% in 1983 to 16% in 1989 and the proportion covered by Medicare increased from 47% to 57% over this same time frame ($p<.001$). The odds ratio for the MCCA year reflects a significant increase in the odds of Medicare coverage at admission (OR=1.68) and a significant decrease in the odds of being admitted in the self-pay (OR=0.67) or Medicaid (OR=0.76) categories even controlling for the obvious linear trend.

We also examined pre-admission location using the nursing home episode file. Table 2 shows the patient's previous location, indicated by service use in the 15 days prior to the start of each episode. When examined for all episodes across periods, there is a small time trend toward having a greater proportion of patients enter from the acute care setting -- 23.3% in the pre-MCCA period to 25.6% in the post-MCCA period ($p<.001$). However, for episodes which

include a Medicare covered SNF component, we observe the effect of dropping the 3-day prior hospital stay requirement. In the MCCA-Plus era, 14.1% of exclusively SNF episodes began from home in contrast to 7.6% prior to the MCCA and only 5.0% after its repeal. Conversely, only 85.4% of episodes followed a general hospital stay during the MCCA period in contrast to 94.6% in the post-MCCA period and 91.9% for episodes which began before 1989. Even among blended (Medicare covered SNF days combined with non-Medicare covered nursing home days) episodes, we observe much lower rates of admission directly from hospital during the MCCA period relative to the pre and post-MCCA periods (57.9% vs. 73.7% and 68.7%, respectively; $p<.001$).

We examined selected case-mix measures in the NHC admission cohort data over a seven-year period. Returning to Table 1, we see that the proportion of residents in the least dependent ADL group--those with three or fewer dependencies--significantly decreased from 13% in 1983 to 8% in 1989, while those with five or more dependencies plus being tube-fed , rose significantly from 12% in 1983 to 17% in 1989. Controlling for this linear trend, there was an additional decrease in the odds of an admission being in the least dependent group ($OR=0.90$) and a slight increase in the odds of an admission being in the most dependent group ($OR=1.02$) during the MCCA year. Among Medicare admissions only (data not shown) this increase in the odds of a more seriously impaired person being admitted reached almost 50% ($OR=1.45$) in 1989. Among the five RUG-II categories, the proportion designated as "special care" exhibited a significant decrease during the MCCA year relative to the general trend ($OR=.86$). When only Medicare admissions were examined (data not shown) we found no trend over time, but an increase in the odds of clinically complex ($OR=1.12$) and behavioral problem ($OR=3.20$) groups being admitted during the MCCA year. Primary diagnoses of pneumonia and lower limb fracture increased

significantly during the study period, cancer admissions remained stable, while cardiovascular disease prevalence among new admissions decreased slightly, but significantly. None of these diagnoses was more or less common in 1989 than expected by trend.

Changes in Length of Stay. We hypothesized that two provisions of the MCCA, the expansion of the SNF benefit coverage period from 100 to 150 days and the revised copayment schedule, would result in longer stays for nursing home residents. In Table 3, we present length of stay data for NHC Medicare admissions and for Medicare-claims defined nursing home episodes. Lengths of stay for NHC residents became significantly shorter over time, from a median of 41 days in 1983 to 33 days in 1988, and during 1989 the median length of stay increased significantly to 39 days. The odds of a stay lasting less than 21 days during the MCCA year were significantly lower ($OR=.74$) than would have been expected based upon a simple linear trend, and stays of more than 150 days were significantly more probable ($OR=1.39$)(data not shown).

Table 3 also presents length of stay distributions for SNF episodes from the nursing home episode file. Among SNF only episodes we observe a significant increase in the median length of stay associated with episodes beginning in the MCCA period. Furthermore, as observed in the NHC data, there was a significant decline in the proportion of SNF stays lasting less than 21 days. There was also a significant increase in lengths of stay of between 22 to 90 and 91 to 150 days for nursing home episodes beginning in the MCCA period.

Changes in Discharge Disposition. We hypothesized that there would be fewer discharges to a hospital because under the MCCA a prior hospital stay was no longer required for the Medicare SNF benefit. Table 4 summarizes changes in discharge disposition data from our two samples. Approximately 44% of all NHC admissions during the period 1983-1989 ended in a

discharge to a hospital; 26% ended in a discharge to home, and 22% ended in death. The remaining 8% of admissions ended with transfer to another nursing home. There were three changes in discharge disposition over the period which were significant based on the Mantel-Haenszel test for trend: discharges to home increased from 24% in 1983 to 28% in 1989; discharges to a hospital decreased from 47% to 39%; and a discharge due to death increased from 21% to 24%. The odds ratios for the MCCA year indicate an additional statistically significant decrease in the probability of discharge to a hospital ($OR= .81$), an increase in the probability of death ($OR=1.08$) and a 21% increase in the odds of a discharge to home ($OR=1.21$).

Table 4 also shows the distribution of reasons for ending a nursing home episode as determined from the Medicare claims data. Overall, 17.4% of discharges during the study period ended in death, 3.5% were still in the nursing home at the end of the follow-up period, 9.6% were referred to home health care and 1% had an acute stay which ended the episode. The latter does not include hospitalizations which were followed by a re-admission to the nursing home. Fewer than 1% of residents went to a rehabilitation facility after a nursing home episode, and 66.5% had gaps of greater than 60 days with no Medicare claims, suggesting a return home.

The MCCA-Plus period, which includes nursing home episodes that begin and end during the MCCA year or extend beyond it, has a significantly higher rate of discharge due to death (20.0%) than the pre-MCCA (18.7%) or post-MCCA (17.1%) periods. Among SNF-only episodes, 36.0% of all discharges in the MCCA-Plus period end in death compared to 33.7% and 31.7% of SNF episodes in the pre and post periods respectively. On the other hand, episodes that include both SNF and non-SNF coverage reveal a trend toward fewer deaths in both the MCCA-Plus and post-MCCA periods.

Home health use was more prevalent as a discharge disposition in the post-MCCA period than either before or during the MCCA, particularly among SNF only episodes. We find 38.4% of post-MCCA discharges received home health while this was true of only 33% of pre-MCCA and 30.5% of MCCA-Plus discharges. These findings are consistent with the increase in home health services as a postacute care option (Neu and Harrison 1988; Steiner and Neu 1993).

Changes in Hospital Use During Nursing Home Episodes. Over all periods, 25% of SNF-only or SNF and non-SNF nursing home episodes included an intervening acute hospitalization. Table 5 shows the distribution of hospital stays by nursing home episode length of stay for each analytic period. It also presents the average and median number of inpatient days per episode and total consumer price index (CPI)-adjusted reimbursement per hospitalization. Contrary to our expectations, we observe an increase in the proportion of SNF and blended episodes with an intervening hospitalization during the MCCA-Plus period (30.5%) relative to the pre-MCCA period (22.8%). Stratifying by nursing home length of stay reveals that nursing home episodes of 22 to 150 days include slightly fewer intermittent hospitalizations during the MCCA-Plus period than the pre-MCCA period.

The average (as well as median) number of inpatient days per nursing home episode (regardless of the number of hospitalizations that may have occurred in an episode) is somewhat longer during the MCCA period than in either the pre- or post periods. Average reimbursements per episode follow a similar pattern with a peak in the MCCA-Plus period, presumably directly related to the longer duration of inpatient stays.

Changes in Payer Source. The MCCA made it possible to change residents' source of payment to Medicare without a hospital admission and the attendant loss to the nursing home of revenue associated with the temporary discharge of the resident. We expected this option to

result in an increase in the rate of payment source changes during the MCCA period. We addressed this issue in both the NHC longitudinal data and the nursing home episode file, albeit in slightly different ways. In the latter case, for each analytic period we examined the proportion of blended SNF and non-SNF nursing home episodes in which beneficiaries coverage changed from non-SNF (as evidenced by Part B claims) to SNF (Part A claim) at least once. In the pre-MCCA period 28.7% of all blended episodes changed from Part B to Part A (in all cases with an intermittent hospitalization), while during the MCCA period this figure was 40.9%, and in the post-MCCA period it was 33.7% (data not shown). Each of these paired comparisons was highly statistically significant ($p<.001$).

Using the NHC longitudinal data we examined the rate of payer source change from self-pay to Medicare and from Medicaid to Medicare among all new admissions to NHC facilities between 1986 and 1990. The NHC data allows for continuous observation of the resident, even through intervening hospitalizations and stays at home. The number of intermittent hospitalizations and the number of home stays were used as time varying covariates in the model, since readmissions to the facility also may be associated with payer source transitions. Using semi-Markov, continuous time and state transition models, we tested for the effect of being a resident in an NHC facility during 1989 on the rate of payer source transition, while controlling for payer source at admission, functional status at admission, selected diagnoses, demographics and the state in which the nursing home was located. The rates are based upon Cox-like proportional hazard models which yield parameter estimates of the effect of a given covariate level on the instantaneous risk of transition from Medicaid to Medicare.

The results of the analyses summarizing the transition from Medicaid to Medicare are presented in Table 6. Included are the actual parameter estimates, the associated adjusted odds

ratios (AORs) and the significance level of each. Residents of NHC homes during 1989 were over 3 times as likely to convert from Medicaid to Medicare relative to 1988, the reference year (AOR 3.1). This effect is true even controlling for the fact that the individual may have originally been admitted to the home under the Medicare SNF benefit (AOR 1.5) and controlling for the number of intermittent discharges to hospital and home. Residents of NHC nursing homes in Kentucky were less likely to convert from Medicaid to Medicare. Demographic factors such as age, sex and education were unrelated to this change in payer source. The only clinical factor related to conversion to Medicare was being in the most ADL impaired group at the time of admission (AOR 1.7; p<.001) suggesting that the most impaired admissions were 70% more likely to convert to Medicare. Similar analyses of the rates of transition from private pay to Medicare among residents in NHC facilities also revealed a large (AOR 1.7; p<.001) and statistically significant increase during the MCCA year (data not shown).

Clinical Content of Nursing Home Episodes. Table 7 presents the daily Medicare charges for accommodation and ancillary as well as a combination of both Part A and Part B charges for separately billed services. Daily Part A accommodation charges per covered SNF day showed a steady increase over time, with pre-MCCA episodes having the lowest average daily charge of \$122 dollars whereas during the MCCA-Plus era the charge was \$149 and in the post-MCCA period accommodation charges stabilized at \$142. Overall average ancillary Part A charges also increased steadily over the study period with charges of \$93 per SNF day in the pre-MCCA period, culminating in average charges of \$125 in the post-MCCA.

Examining the combined Part A and Part B charges for various classes of services, we see that the largest increases occurred after the MCCA period. For example, the two highest daily charges were for therapy services and drugs. In both cases the differences between the pre and

actual MCCA period were not as large as the increment that occurred after the repeal of the MCCA (e.g. \$26 in MCCA-Plus to \$35 in post-MCCA for therapy services). Furthermore, while we see quite limited charges for “routine” services which do not change over time, there is a 50% increase in the average “sicker” types of service charges between the MCCA and post-MCCA period, although no difference in the pre-MCCA and MCCA-Plus periods (\$6 vs. \$6).

Another method of examining the clinical content of nursing home episodes is to examine the frequency of any service use within periods. The bottom section of Table 7 shows the proportion of episodes with any use of each type of service. Within each analytic period, the drug category had the highest proportion of episodes with claims. We see a general increase in claims across almost all classes of services between the pre-MCCA period through the MCCA period into the post-MCCA period. For example, 56% of episodes in the pre-MCCA period included a charge (either Part A or Part B) for therapy services. During the MCCA era this proportion reached 60% and increased to 69% among episodes that started after its repeal. The proportion of episodes including charges for “high tech” services combined into the “sicker” class increased during the MCCA period and decreased in the post-MCCA period (31%, 38%, 33% respectively), suggesting not a trend but a specific effect of the MCCA period.

Changes in Hospice Case-Mix and Length of Stay. We examined claims data on Medicare beneficiaries entering hospice from 1987 through 1990 to study the impact of the MCCA’s elimination of the 210-day limit for hospice services on case-mix and length of stay. Over this four-year-period the proportion of beneficiaries with non-cancer diagnoses increased steadily (Table 8). Only 12% of patients entering hospice during 1987 had non-cancer diagnoses, compared to 15% in 1988, 16% in 1989 and 17% in 1990 ($p < .01$). Freestanding and Home Health Agency (HHA)-based hospices both revealed significant increases in the proportion of

non-cancer patients but the SNF and hospital-based programs did not. However, SNF programs had very few patients and hospital-based programs had higher base rates of non-cancer beneficiaries than did the other programs (16.4% in 1987).

The pattern of medical service use prior to hospice entry provides another indication of the types of patients entering hospice. Table 8 reveals that there has been a steady and statistically significant increase over time in the proportion of beneficiaries with nursing home stays prior to entering hospice. This increase does not appear to be related to the MCCA year since the rate continues to rise in 1990. There is a corresponding decrease in the number of patients with prior inpatient hospital use.

The lower section of Table 8 examines the length of stay for hospice beneficiaries over the study period, demonstrating remarkable stability during this period. With the exception of short-stay patients (<15 days), we observe small increases in the number of beneficiaries staying 90 days or longer, particularly during 1989. In 1987, 11.2% of beneficiaries had hospice stays of 90 days or longer, increasing to 14.5% in 1988 and to 17.3% in 1989. Since the hospice length of stay distribution is so obviously skewed, measures of central tendency may mask changes in the long stay group. To address this, we looked for changes in the proportion of beneficiaries remaining under hospice care for 210 days or more. Consistent with the policy incentives and our hypothesis, we found that the number of beneficiaries with hospice stays of 210 days or more was 5.7% of those entering hospice in 1987, increasing to 7.3% in 1989.

CONCLUSIONS

We used two data sources to assess the impact of the Medicare Catastrophic Coverage Act on the rate and pattern of nursing home and hospice services used by Medicare beneficiaries. Most of our hypotheses about the impact of the MCCA were confirmed and we observed similar trends for a 1% random sample of Medicare beneficiaries as well as the nonrandom population of residents of a chain of for-profit nursing homes. The pattern of findings suggests that the nursing home industry and Medicare beneficiaries benefited from the MCCA changes to the SNF and hospice benefits. In both data sets we found that the proportion of all nursing home episodes with a Medicare SNF component increased in 1989. This result is consistent with the work of Aaronson and colleagues (1994), who found a significant increase in Medicare patient days among Pennsylvania nursing homes in 1989. It is also consistent with the results obtained by Liu and Kenney (1993) in their facility-level analysis of Medicare Medicaid Automated Certification System (MMACS) data. They found a significant increase in the proportion of nursing home residents whose payer source was Medicare during 1989. We found that more residents were admitted to nursing homes directly from home in that year, particularly those reimbursed by Medicare. There was a shift in the case mix severity of individuals entering and cared for in nursing homes as evidenced by the significant increase in clinically complex patients admitted to NHC nursing homes in 1989 and the increase in deaths within the nursing home in both the NHC and the Medicare claims files. We observed an increase during the MCCA period in the proportion of nursing home episodes with a Medicare claim for services for "sicker" patients (i.e., parenteral nutrition or therapies, pulmonary care, oxygen, inhalation therapy, special services and consultations). The length of stay of nursing home episodes, particularly Medicare SNF episodes, increased dramatically in 1989, with a reduction in the proportion of all stays that lasted less than 7 days and an increase in the proportion of stays lasting between 22 and 150 days. Thus, there

was a significant increase in the total number of Medicare covered SNF days in 1989 relative to earlier as well as later years. Although we had expected that the rate of hospital use among nursing home residents would have declined due to the MCCA provisions allowing a shift to Medicare payment without a hospital admission, we observed little reduction in hospital use except among nursing home episodes lasting between 91 and 150 days. On the other hand we observed a large increase in the proportion of episodes in which nursing home residents shifted their payer source to Medicare from either Medicaid or private pay. Such payer source transitions were over 3 times more prevalent in 1989 than in previous years among NHC residents and over 50% more common, based upon the less precise but nationally representative Medicare claims data. Thus, there was a substantial increase in Medicare SNF use with no off-setting reduction in Medicare reimbursed hospitalizations.

Attributing all these changes unequivocally to the MCCA is difficult, however, since many of the trends which began in 1989 continued after the MCCA was repealed. For instance, although the observed increase in the proportion of nursing home episodes with either Part A or Part B expenditures associated with "high tech" treatments for sicker patients decreased in the post-MCCA period, it did not return to pre-MCCA levels. Moreover, the actual expenditures per episode day for these services did not increase until after 1989. Thus, the MCCA may have accelerated industry-wide changes that were already underway. In the paragraphs below we discuss our findings in light of some of these trends.

The MCCA increased Medicare's role in the financing of nursing home care in several ways. The elimination of the 3-day prior hospitalization requirement clearly allowed for a substantial increase in the percentage of nursing home episodes covered by Medicare. Prior to the MCCA, 83.2% of all nursing home episodes included no SNF covered days. This was true of

only 74.8% of all nursing home episodes that began in 1989. Changes in the copayment schedule provided the incentive for longer stays. The duration of SNF and blended SNF and non-SNF episodes was substantially longer and included more covered days during the MCCA period. However, this expansion of Medicare's role in the financing of nursing home care does not appear to be related solely to the introduction of MCCA. The proportion of episodes with SNF covered days remained quite high in the post-MCCA period (25.2% vs. 24.2%). As a percentage of total Medicare payments, SNF expenditures rose from 1.2% in 1988 to 3.0% in 1989, leveled off at 1.8% in 1990 and increased to 2.1% and 2.6% during 1991 and 1992. (HCFA, 1995).

Three other factors may have contributed to Medicare's increased role in financing long-term care beyond the MCCA period. First, the 1988 clarification of the eligibility requirements for skilled care under the Medicare skilled nursing benefit made it easier to justify Medicare SNF reimbursement for patients. Second, we know that between 1987 and 1991 there was a 47% increase in the proportion of all residents of Medicare/Medicaid certified nursing homes whose care was covered by Medicare (Mor, Banaszak-Holl, Zinn et al., in press). Having "geared up" to provide Medicare services to residents because of the MCCA, facilities had an incentive to continue to provide those services. Finally, OBRA-mandated resident assessments and requirements to provide services to maintain the "highest practicable level of physical, mental and psychosocial well-being" for residents may have helped facilities justify Medicare SNF eligibility and increase the number of resident days for which they received Medicare reimbursement (Morris et al., 1995).

We observed substantial and consistent effects of the MCCA on the length of nursing home episodes, with those in the MCCA period being longer and containing more Medicare covered days. Both these findings are consistent with the MCCA associated increase in the

number of covered days (from 100 to 150) and the change in the copayment structure. Under the MCCA not only did the size of the copayment drop substantially but it only applied for the first 8 days of care rather than from the 21st through the 100th day of care, creating incentives for longer stays.

The finding that during the MCCA period residents were more likely to die within the nursing home than to be discharged to a hospital to die is consistent with the increasing trend toward the diversification of nursing home services, including the development of special care units for the terminally ill (Zinn and Mor, 1994). Both the Medicare claims data and the more detailed NHC data confirm the fact that during the MCCA year nursing homes were more likely to allow patients to remain in the nursing homes to die. In previous years these residents would have been transferred to hospital. The NHC data suggest that during 1989, because of the elimination of the 3 day hospital stay requirement, patients with terminal conditions also were being admitted directly from home, by-passing the hospital; it was this group that was responsible for the higher observed mortality rate. Our analyses of the claims data for a representative population of Medicare beneficiaries reveal similar results. We observe a large increase in the proportion of SNF-only episodes that originate from home or an unknown location (7.6%, 14.1% and 5.0% respectively for pre, MCCA and post). The proportion of all SNF only episodes ending in death increased from 33.7% to 36.0% and then dropped again to 31.7% in the three analytic periods.

This pattern of findings is consistent with recent trends toward a reduction in deaths in the hospital and a substantial increase in deaths occurring in the nursing home (McMillian et al., 1990; Sager et al., 1989). The observed effect of an increase in death in the nursing home is also consistent with the interpretation that the MCCA may have been used by some nursing homes to

admit a new class of patients -- those with a terminal prognosis who were admitted from home.

Cross-walking the SNF episodes between Tables 2 and 4 reveals large increases in admissions directly from home and an admittedly smaller increase in nursing home deaths.

The elimination of the 3 day prior hospital stay also had an effect on the admission of individuals into nursing homes from home or another unknown location. That unknown location includes individuals who were already residing in a nursing home. For nursing home episodes with a SNF component, the decrease in the proportion of admissions from a hospital during the MCCA was almost mirrored by an increase in such admissions from home or an unknown source (25.6%, 41.0% and 30.5% for pre, MCCA and post periods respectively). This suggests not only an increase in admissions directly from home but also transfers from a non-SNF to a SNF covered stay. This perspective is largely confirmed when we compare the proportion of SNF and blended episodes in which there is a payer source change within the episode from non-Medicare covered to Medicare covered. The highly significant increase (from 28.7% to 40.9%) from the pre to the MCCA period was only possible because Medicaid and private pay residents were being transferred to Medicare coverage during 1989. This interpretation is borne out in the NHC data which reveals a 3 fold increase in the rate of payer source change from Medicaid to Medicare in 1989 relative to the prior year, controlling for a wide array of other factors. Clearly, the availability of higher reimbursement for serving the needs of patients who met Medicare eligibility requirements was sufficient incentive to observe a change in national data.

To offset the increased access to the SNF benefit under MCCA, we hypothesized that there might be compensating reductions in hospital use among patients already residing in nursing homes. Prior research on this topic has been limited by the fact that it has not been possible to identify Medicare beneficiaries residing in nursing homes. Such prior efforts using national

samples relied on only crude measures such as reductions in hospitalization rates in local markets. In a county analysis of the impact of the MCCA on hospitalization, Kidder and his colleagues (1991) found no reductions in hospitalization or rehospitalization rates of Medicare beneficiaries during the MCCA year. Because we have defined nursing home episodes on the basis of Part B claims (using place of service code) as well as Part A SNF claims, for the first time we have been able to more precisely test the "substitution" of SNF care for hospital care under the MCCA. In spite of this increased precision, we still find no evidence that the MCCA resulted in fewer, or shorter, hospitalizations among persons already residing in nursing homes. While there is some small reduction in the likelihood of being hospitalized during the MCCA period in the mid-range length of stay groups for those already in a SNF covered stay, there is no overall decrease in the hospitalization rate. Among nursing home episodes lasting 22 to 90 days there was a drop from 19.6% to 18.3% of episodes with a hospitalization while among episodes lasting 91 to 150 days the drop is from 44.5% to 41.5%. In both cases, in the post-MCCA period the hospitalization rate increased beyond the earlier level. Thus, if there was a reduction in the rate of hospital admissions among nursing home residents during the MCCA period, our data suggest that it was small and clearly not sufficient to offset the large increases in SNF days.

Although there is a clinical rationale for not hospitalizing a resident who could be transferred to a SNF level of care (Kerr & Byrd, 1991), the MCCA did not provide sufficient incentives or opportunities to reduce these hospitalizations. Recent research suggesting that the medical resources available in a facility have a substantial influence on the rate of hospital use, even controlling for patient mix, speaks to the difficulty of changing clinical practices in settings with limited medical input and where the tradition has been to send patients with unstable vital signs to the emergency room (Teresi et al., 1991; Castle and Mor, in press). Since the

modification of SNF benefit eligibility criteria was not accompanied by new clinical care protocols for managing acute illnesses in the nursing home, it may not have been realistic to expect a reduction in the rate of hospitalization. Future refinements of the Medicare SNF benefit could address this issue by placing reasonable limitations on the utilization of acute care services by individuals who elect long-term care (SNF) coverage.

While the nursing home provisions of the MCCA made it possible for beneficiaries to qualify for SNF coverage without a prior hospitalization, there were other provisions of the legislation that reduced the financial burden of hospital use for beneficiaries and, therefore, counterbalanced the reductions in hospital days which were anticipated to offset the increase in SNF days. The MCCA changed the hospital deductible provision from one deductible per "spell of illness" period² to one deductible per calendar year. It also eliminated the 90-day coverage limit per spell of illness and the copayments for hospital stays. These changes reduced beneficiaries' out-of-pocket expenses for inpatient care. Although this policy was consistent with the legislative goal of reducing the risk of catastrophic financial losses for beneficiaries, it may have masked or diluted any measurable reduction in hospital use by nursing home residents.

Interpreting the observed increase in the medical and therapeutic intensity of nursing home episodes is highly complex since the way nursing homes bill for services varies tremendously and may have changed for any given facility over the 6 year study period. We combined various cost centers on the Part A SNF bill and various CPT codes on the Part B claim into common service classes and found strong increases in the proportion of nursing episodes in which patients received services such as therapies, drugs, and radiology as well as a composite indicator of "high tech" services. While this phenomenon might be due to "unbundling" of the services offered to nursing

² A spell of illness is defined as the period beginning on the date of a hospital admission and ending when the beneficiary has not been in a hospital or SNF for 60 days.

home patients, we do see a 30% to 50% increase in the average charges per day for therapies, drugs and the composite of services delivered to "sicker" patients. These changes did not occur consistently in 1989, but in later years, suggesting that the observed changes are part of a trend and not a specific outcome of the MCCA. This is consistent with anecdotal evidence that the mix of services provided to nursing home residents has become much more complex over the last decade. It also is consistent with the more recent emergence of special care units which are increasingly common in US facilities, even without considering the special Alzheimer's units (Zinn and Mor, 1994). Finally, these data reflect the early phases of what has been recently characterized as an explosion of sub-acute and post-acute treatment settings that have emerged in response to hospitals' continuing efforts to reduce their lengths of stay, shifting to extended outpatient surgical and diagnostic procedures and deflecting admissions in general for fear of retroactive denial.

Our hospice findings indicate that the MCCA also had an impact on hospice, but a less dramatic one. Although the proportion of non-cancer patients using hospice services increased, this trend may have already been underway, as we observed that more nursing home residents began to enter hospice. This finding is consistent with the expanded role of nursing homes in the care of the dying patient and the growing number of hospices and nursing homes who are jointly caring for these individuals.

We feel that if we repeated these analyses for the period 1992 through 1995, we would observe even larger increases in the use of specialized services in nursing homes. Future analyses should be able to make use of recently available population based data derived from the computerization of the Resident Assessment Instrument Minimum Data Set (MDS), which contains information about the relative complexity of the mix of patients in any given facility but

also selected information about the "intensity" of services provided. Once longitudinal information from this powerful data set becomes available, much more elaborate, case mix adjusted analyses will be possible.

In summary, the MCCA clearly accelerated changes in the nursing home industry and in the types of residents served as well as the services provided. Some might argue that the excitement about sub-acute and post-acute care that is sweeping the field would not have been possible had not the MCCA stimulated the industry to increase its capacity to meet the needs of the traditional Medicare SNF patient. This capacity building and stimulus to compete in the Medicare SNF field came at a price. There was a substantial increase in the number of covered Medicare days and Medicare SNF expenditures and little compensatory reduction in hospital use. The MCCA permitted the nursing home industry to play new roles in the provision of care for the terminally ill and for the severely medically compromised. These new roles are now being more fully developed in the market place for delivering medical care to the chronically ill -- the world of managed care. Whether the nursing home industry will be able to successfully compete on price and quality with post-acute facilities sponsored by hospital systems will be seen over the remainder of this decade. In the final analysis, for the nursing home industry the MCCA was more than a series of technical modifications to Medicare SNF reimbursement eligibility rules. It was the recognition of a transformation in the delivery of skilled nursing care and a first step in acknowledging the indivisibility of the acute and long-term care sectors for chronically ill and frail elders.

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TABLE 1
NATIONAL HEALTH CORPORATION ADMISSION DATA:
FREQUENCIES, IN PERCENT, BY ADMISSION YEAR FOR ALL ADMISSIONS

	(N=59,275)								Trend ^a	Odds Ratio ^b for 1989
	1983	1984	1985	1986	1987	1988	1989	1983-1989		
ADMISSION LOCATION										
Home	9.2	9.1	9.4	9.8	9.5	9.8	11.2	<.001	1.14*	
Hospital	86.6	87.1	86.7	86.5	85.9	84.6	84.6	<.001	0.88*	
Nursing Home	4.2	3.8	3.8	3.6	3.6	4.3	4.2	NS	1.09	
PRIMARY PAYER										
Self	19.4	21.1	21.7	26.5	27.5	26.5	22.5	<.001	0.67*	
Medicaid	28.1	25.5	23.5	22.0	22.6	22.0	16.0	<.001	0.76*	
Medicare	47.4	48.7	50.6	46.7	45.2	47.2	58.9	<.001	1.68*	
Functional and Clinical Factors										
ADL DEPENDENCIES										
0-3 deps	12.7	11.3	10.8	10.8	9.8	10.1	8.4	<.001	0.90*	
4 deps	33.2	36.3	36.8	35.1	33.1	32.5	34.9	NS	1.09*	
5 deps, able to eat	42.2	39.4	38.0	38.7	39.8	40.4	39.3	NS	1.01	
5 deps, tube-fed	11.9	13.0	14.5	15.3	17.3	17.0	17.4	<.001	1.02	
RUG-II										
Special Care	27.2	27.6	29.1	32.1	33.6	334.	32.5	<.001	0.86*	
Rehabilitation	16.9	16.7	14.2	10.6	11.1	9.8	9.1	NS	1.01	
Clinically Complex	17.8	18.4	18.6	18.2	17.7	18.0	19.0	NS	1.07	
Behavioral	1.1	1.0	0.6	0.6	0.6	0.5	0.5	<.001	1.43	
Physical	37.0	36.2	37.5	38.5	36.9	38.3	38.8	NS	1.02	
PRIMARY DIAGNOSIS										
Cancer	6.8	7.4	7.2	7.1	7.8	7.5	7.8	NS	1.00	
Cardiovascular Disease	18.8	16.9	15.9	15.8	17.1	15.6	16.3	<.001	1.00	
Pneumonia	1.5	1.9	2.5	2.1	2.3	3.0	2.8	<.001	0.87	
Lower Limb Fracture	10.0	5.8	2.8	9.0	12.5	13.4	14.0	<.001	0.99	

^aMantel-Haenszel test for trend used except where noted; hence a separate significant level for each row is generated.

^bOdds ratio for 1989 year term from model including term for 1983 through 1989.

Table 2
PreAdmission Location of Nursing Home Episodes Within MCCA Periods

	Pre-MCCA n=31,799	MCCA-Plus n=14,510	Post-MCCA n=32,656	
	%	%	%	
All Episodes				
Home/Unknown	76.3	75.0	73.9	***
Home care	0.2	0.2	0.3	
Acute care	23.3	24.4	25.6	***
Rehabilitation	0.2	0.3	0.3	
SNF episodes	n=3,168	n=1,820	n=4,087	
Home/Unknown	7.6	14.1	5.0	***
Home care	0.1	0.1	0.0	
Acute care	91.9	85.4	94.6	***
Rehabilitation	0.4	0.4	0.4	
SNF and non-SNF				
Blended episodes	n=2,182	n=1,834	n=3,824	
Home/Unknown	25.6	41.0	30.5	***
Home care	0.1	0.2	0.1	
Acute care	73.7	57.9	68.7	***
Rehabilitation	0.6	1.0	0.7	
Non-SNF Episodes	n=26,449	n=10,856	n=24,745	
Home/Unknown	88.7	91.0	91.9	***
Home care	0.2	0.2	0.3	*
Acute care	11.0	8.6	7.6	***
Rehabilitation	0.2	0.2	0.2	

* p<.05

*** p<.001

TABLE 3
Length of Stay of Patients Admitted to Nursing Homes

NATIONAL HEALTH CORPORATION DATA: MEDICARE ADMISSIONS (N=33,457)

MEDIAN LENGTH OF STAY IN DAYS	Trend ^a							
	1983	1984	1985	1986	1987	1988	1989	1983-1989
41	34	34	30	32	33	39	<.001*	

^aMantel-Haenszel test for trend.

NURSING HOME EPISODE FILE

SNF Episodes	Pre-MCCA n=3,168	MCCA-Plus n=1,820	Post-MCCA n=4,087	***
	%	%	%	
Mean (sd)	34.1 (57.9)	39.7 (65.5)	32.1 (50.4)	
Median	17	21	19	
0-7 days	21.1	18.5	18.7	
8-21 days	38.0	33.1	38.2	
22-90 days	33.0	38.1	36.7	
91-150 days	5.0	6.7	5.0	
151-3000 days	2.9	3.6	1.5	

*** p<.001

TABLE 4
Discharge Disposition of Patients Admitted to Nursing Homes

NATIONAL HEALTH CORPORATION ADMISSION DATA (N=59,275)

	1983	1984	1985	1986	1987	1988	1989	Trend ^a	Odds Ratio ^b for 1989
DISCHARGE LOCATION									
Home	24.0	24.0	25.3	24.8	23.8	24.8	28.5	<.001	1.21*
Hospital	46.7	46.8	44.3	45.1	45.3	44.8	39.2	<.001	0.81*
Nursing Home	8.2	8.0	8.8	8.5	8.3	7.8	8.0	NS	0.98
Dead	21.0	21.2	21.6	21.5	22.5	22.6	24.3	<.001	1.08*

^aMantel-Haenszel test for trend used except where noted; hence a separate significant level for each row is generated.

^bOdds ratio for 1989 year term from model including term for 1983 through 1989.

NURSING HOME EPISODE FILE

	Pre-MCCA n=31,799	MCCA-Plus n=14,510	Post-MCCA n=32,656	
	%	%	%	
All Episodes				
Home/Gap >60 days	71.0	67.7	63.8	***
Home health	9.1	8.8	11.5	***
Acute care	1.2	0.9	0.9	***
Death	18.7	20.0	17.1	***
Rehabilitation	0.0	0.0	0.0	
Continuing stay	0.0	2.7	6.7	
SNF-Only Episodes				
	n=3,168	n=1,820	n=4,087	
Home/Gap >60 days	31.5	32.6	28.5	***
Home health	33.0	30.5	38.4	***
Acute care	1.9	0.8	1.2	**
Death	33.7	36.0	31.7	**
Rehabilitation	0.1	0.2	0.1	
Continuing stay	0.0	0.0	0.2	
SNF and Non-SNF Blended Episodes				
	n=2,182	n=1,834	n=3,824	
Home/Gap >60 days	38.8	38.0	33.0	***
Home health	15.4	9.1	11.5	***
Acute care	1.1	1.2	0.8	
Death	44.6	42.8	37.2	***
Rehabilitation	0.1	0.0	0.0	
Continuing stay	0.0	9.1	17.5	

** p<.01, *** p<.001

Table 5
Distribution, Duration and Reimbursement of Intervening Hospitalizations
by Nursing Home Episodes Length of Stay

	Pre-	MCAA-	Post-
	MCAA n=5350	Plus n=3654	MCAA n=7911
All SNF and Blended Episodes	22.8	30.5	30.6
Nursing Home Episode Length of Stay			
0-7 Days	0	0	0.1
8-21 Days	1.4	1.7	1.5
22-90 Days	19.6	18.3	21.6
91-150 Days	44.5	41.5	48.8
151-3000 Days	68.0	69.0	72.8
Number Inpatient Days per Hospitalization			
Mean	17 (15)	22 (14)	19 (12)
(Median)			
Reimbursement per Hospitalization*			
Mean	8076 (6005)	9755 (6393)	8073 (5635)
(Median)			

* cpi adjusted

Table 6
Semi-Markov Analysis of the Rate of Transition from Medicaid to Medicare:
Effect of Year of Residence and Other Covariates

Variable	Parameter Estimate	AOR	P=Value
Number of Events	791		
Number of Medicaid Recipients	4211		
Medicare at Admission	0.41	1.51	0.00
ADL=2 Dependencies	0.05	1.05	0.76
ADL=3 Dependencies	0.19	1.21	0.22
ADL=4 Dependencies	0.11	1.11	0.51
ADL=5 Dependencies	0.55	1.73	0.00
Acute Diagnosis	-0.14	0.87	0.93
Chronic Diagnosis	-0.15	0.86	0.14
Female	-0.14	0.87	0.15
Age in years >65	0.01	1.01	0.07
Married	0.05	1.05	0.64
Tennessee	0.09	0.91	0.51
South Carolina	0.15	1.16	0.21
Kentucky	0.33	0.72	0.00
Number of Home Episodes	0.55	0.58	0.00
Number of Hospital Episodes	0.28	0.76	0.07
High School Graduates	0.32	1.38	0.00
College Graduates	0.29	1.34	0.00
Admission in 1986	0.38	1.46	0.13
Admission in 1987	0.13	0.88	0.45
In NH During 1989	1.14	3.12	0.00
In NH During 1990	0.52	1.66	0.00
High School Graduate in 1989	0.39	0.68	0.10
High School Graduate in 1990	0.33	0.72	0.23

Table 7
Medicare Charges for Nursing Home Episodes

SNF or Blended Nursing Home Episodes	Pre-MCCA n=5350		MCCA-Plus n=3654		Post-MCCA n=7911	
	Mean	Median	Mean	Median	Mean	Median
Part A Charges Per SNF Day						
Accommodation (\$)	122	100	149	107	142	110
Ancillary (\$)	93	54	107	56	125	78
Combined Part A and Part B daily charges (\$)						
Therapy	25	3	26	3	35	10
Laboratory	5	0	5	1	7	1
Drug	20	5	18	4	24	6
Radiology	3	0	3	0	3	0
Routine ^{**}	0	0	1	0	1	0
Sicker ⁺⁺	6	0	6	0	9	0
Supplies	9	1	8	1	10	1
Visits	2	0	1	0	2	1
Psych Care	0	0	0	0	0	0
Percentage of SNF or Blended Nursing Home Episodes With Any Charges During the Episode						
	Pre-MCCA n=5350		MCCA-Plus n=3654		Post-MCCA n=7911	
	% with any charge		% with any charge		% with any charge	
Combined Part A and Part B charges						
Therapy	56		60		69	
Laboratory	57		66		68	
Drug	79		85		88	
Radiology	48		58		58	
Routine ^{**}	40		54		57	
Sicker ⁺⁺	31		38		33	
Supplies	67		71		73	
Visits	51		62		70	
Psych Care	2		4		4	

** Routine = sum of foot care, incontinence DME, decubitus, venipuncture and chest x-ray.

Sicker = sum of parenteral, pulmonary care, oxygen, inhalation therapy, special services and consults.

Table 8
Changes in Hospice Case-Mix and Length of Stay

Proportion of Beneficiaries with Non-Cancer Diagnoses	Year Entered Hospice							
	1987		1988		1989		1990	
	No.	%	No.	%	No.	%	No.	%
All Hospices***	181	12.4	343	14.5	512	16.2	663	17.2
Hospital Based	23	16.4	47	14.8	98	15.3	110	14.8
SNF Based	7	12.5	7	8.6	8	9.9	22	18.6
HHA Based***	71	12.5	136	14.5	202	17.5	254	18.0
Freestanding***	80	11.5	153	14.8	204	16.0	265	17.6
Percent of Beneficiaries with Medicare Expenditures for 180 Days Prior to Hospice								
Nursing Home***	111	6.6	181	7.4	261	8.0	416	9.9
Home Health	593	35.3	828	33.9	1,071	32.8	1,465	34.8
Inpatient***	1,229	73.1	1,728	70.9	2,276	69.7	2,887	68.6
Other Part A	5	0.3	11	0.5	18	0.6	20	0.5
Any Physician*	1,499	89.1	2,133	87.4	2,873	87.9	3,648	86.7
Other Part B	1,448	86.1	2,091	85.7	2,809	86.0	3,559	84.5
Any Expenditures	1,577	93.8	2,229	91.3	2,998	91.7	3,819	90.7
Length of Stay (days of coverage)								
<15	790	46.5	956	38.8	1,266	38.2	1,797	42.1
15-29	288	16.9	478	19.4	630	19.0	705	16.5
30-89	432	25.4	675	27.4	841	25.4	1,052	24.6
90-149	115	6.8	180	7.3	285	8.6	356	8.3
150-209	59	3.5	92	3.7	172	5.2	210	4.9
210+	16	0.9	86	3.5	217	3.5	152	3.6
Mean Length of Stay (in days)		37.2		48.3		51.8		48.4
(SD)		(64.4)		(85.1)		(88.3)		(80.2)
Median Length of Stay (in days)		17.0		22.0		22.0		20.0
Percent Enrolled Beyond 210 Days by Hospice Type								
All Hospices	96	5.7	151	6.1	241	7.3	271	6.3
Hospital Based	7	3.2	23	6.7	48	7.2	42	5.4
SNF Based	2	3.0	4	4.9	6	6.8	5	4.2
HHA Based	37	5.6	52	5.3	79	6.5	97	6.2
Freestanding	50	6.6	72	6.8	108	8.2	122	7.0

Chi-Square Test of Significance: *p<.10, **p<.05, ***p<.01

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